Flex Circuits Design Guidelines

	Standard	Special	NPD
Dimensions of single circuit device on a sheet			
Tolerances of single circuit board dimensions, laser cutting	±0.050 mm	0.025 mm	0.015 mm
Drilled holes (laser drilling, not preferred)	≥0.050 mm	≥0.025 mm	≥0.010 mm
Imaged holes (for liquid polyimide layers only)	≥0.050 mm	≥0.025 mm	≥0.015 mm
Distance edge of hole to substrate edge or cut-out	>0.1 mm	>0.050 mm	>0.025 mm
Distance edge of hole to edge of another hole (Kapton or LCP) Via	+0.1 mm	+0.050 mm	+0.025 mm
Distance edge of hole to edge of another hole (liquid polyimide) Via	≥via diameter +0.05 mm	+0.025 mm ≥via diameter	+0.015 mm
Tolerance hole center-to-center (Kapton or LCP)	≥ ± 0.020 mm		
Tolerance hole center-to-center (Liquid Polyimide)	≥ ± 0.010 mm		
Metallization annular ring (rim) around a drilled holed top and bottom	≥0.050 mm	on request	not standard
Distance edge of conductor to substrate edge:	≥0.100 mm	0.050 mm	0.025 mm
Conductor Line & Space aspect ratio to metal thickness:	1 to 1	up 2x	2.5X
Kapton/LCP flex	10 µm	5 µm	
Liquid polyimide flex	7 µm	5 µm	3 µm

Cirtec MEDICAL

1001 Pawtucket Blvd., Lowell, MA 01854
Phone 1.800.261.2557 • metsales@metrigraphicsllc.com
www.metrigraphicsllc.com

	Standard	Special	NPD
Min. lines and spaces with respect to a maximum aspect ratio of 1 (electroplated)			
Tolerance conductor of width	0.002 mm ± 0.005 mm (or 10%)	0.001 mm ± 0.003 mm (or 5%)	0.00075mm ± 0.003mm / 0.005 mm
Alignment tolerance metal to machined feature	0.005 mm ± 0.030 mm	0.003 mm ± 0.020 mm	± 0.020 mm 0.001 mm
Alignment tolerance front to back	0.010 mm ± 0.060 mm	0.008 mm ± 0.030 mm	0.005 mm
Laser machined features	0.05 mm	0.025 mm	
Dimensions	≥ 1.000 mm x 1.000 mm	≥ 0.500 mm x 0.500 mm	
Distance edge of feature to substrate or another feature	≥ 0.025 mm	0.020 mm	0.015 mm
Locational tolerance to substrate edge	± 0.025 mm	0.020 mm	0.015 mm
Multi-layer			
Substrate thickness	12.5 microns	On request	On request
Number of layers (metal)	up 7	On request	On request
Number of layers (substrate)	up 6	On request	On request

Metallization For Standard Flex Circuits and Microflex Circuits

Purpose	Material	Thickness Range
Adhesion	Ti, TiW, Cr, NiCr	0.02 µm - 0.05 µm sputtered
Diffusion barrier	Pt, Pd, TiW, Ni	50 nm - 200 nm sputtered
Conductor	Au, Ni, Cu, Al	0.1 µm to 1.0 µm sputtered

1001 Pawtucket Blvd., Lowell, MA 01854
Phone 1.800.261.2557 • metsales@metrigraphicsllc.com
www.metrigraphicsllc.com